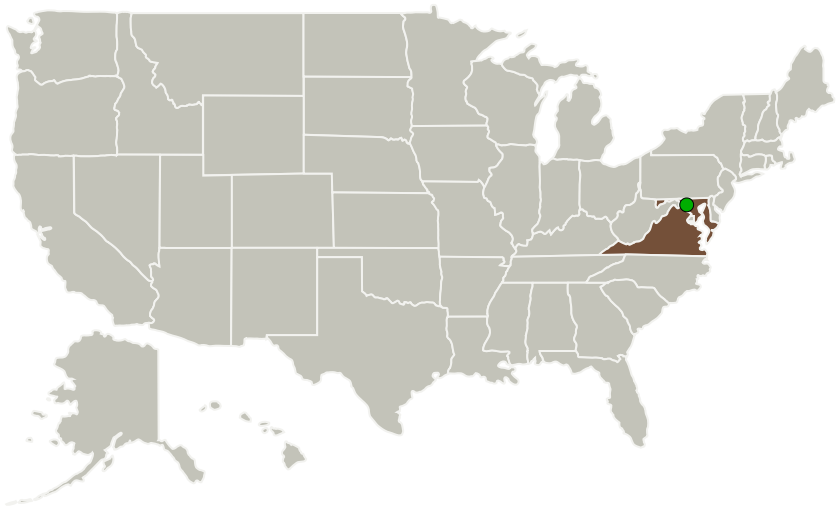
# Software Engineering Tools for Scientific Models, Phase I

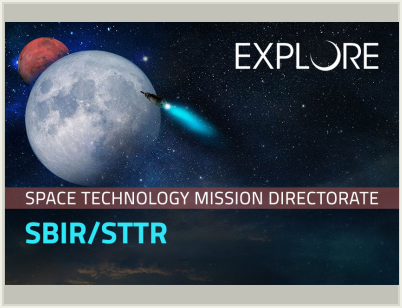
Completed Technology Project (2011 - 2011)

## Project Introduction

We design and demonstrate the feasibility of extending the open source Eclipse integrated development environment (IDE) to support the full range of capabilities now available to Java developers but for Fortran. We have experience in this process from having done analogous SBIR work for the Ada language with the Navy and Missile Defense Agency. As was the case for Ada, there is an existing but insufficient plug in for Fortran now available for Eclipse, namely Photran. We will leverage Harmonia's past work on Rise plug-in for Ada, c, C++ to create product that builds on Eclipse Photran as well as pFUnit and FUnit. Facilities we will implement include annotating source code as an overlay to the existing code, so that developers learning about the code are free to mark it up without affecting the original code, and creating various views tracing execution, showing potential concurrency, etc. We also integrate unit testing, graphical editing of workflows to create scripts that are used with Fortran, support the analysis and porting of Fortran code to different target architectures, and provide a web service link to accommodate cases where the Fortran compiler runs on a different machine from the IDE. Our goal is a 25% productivity improvement.

## Primary U.S. Work Locations and Key Partners



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**Small Business Innovation Research/Small Business Tech Transfer**

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| Organizations Performing Work | Role | Type | Location |
|---|---|---|---|
| Harmonia Holdings Group LLC | Lead Organization | Industry<br>Small Disadvantaged Business (SDB), Women-Owned Small Business (WOSB), Minority-Owned Business | Blacksburg, Virginia |
| Goddard Space Flight Center(GSFC) | Supporting Organization | NASA Center | Greenbelt, Maryland |

| Primary U.S. Work Locations | |
|---|---|
| Maryland | Virginia |

## Project Transitions

**February 2011:** Project Start

**September 2011:** Closed out

**Closeout Documentation:**

- Final Summary Chart*(https://techport.nasa.gov/file/138514)*

## Organizational Responsibility

**Responsible Mission Directorate:**

Space Technology Mission Directorate (STMD)

**Lead Organization:**

Harmonia Holdings Group LLC

**Responsible Program:**

Small Business Innovation Research/Small Business Tech Transfer

## Project Management

**Program Director:**

Jason L Kessler

**Program Manager:**

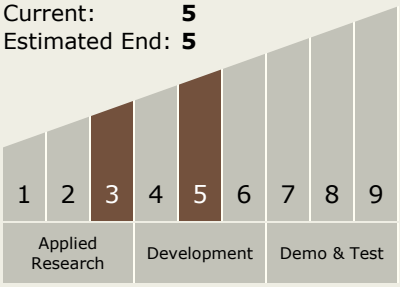
Carlos Torrez

**Principal Investigator:**

Marc Abrams

## Technology Maturity (TRL)

Start: **3**
Current: **5**
Estimated End: **5**



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## Technology Areas

**Primary:**

- TX11 Software, Modeling, Simulation, and Information Processing
  - TX11.1 Software Development, Engineering, and Integrity
    - TX11.1.1 Tools and Methodologies for Software Design and Development

## Target Destinations

The Moon, Mars, Outside the Solar System, The Sun, Earth, Others Inside the Solar System